

**IN THE DRAWINGS:**

Please amend the drawings as shown in the attached Proposed Changes to the Drawings.

**REMARKS**

The Office Action mailed April 18, 2001, has been reviewed and the comments of the Patent and Trademark Office have been considered. Claims 1-22 were pending in the application. Claims 1, 9, 12, and 20 have been amended. Claims 9 and 20 have essentially been rewritten in independent form. No claims have been cancelled. Therefore, claims 1-22 are pending in the application and are submitted for reconsideration by the Examiner.

The Examiner is sincerely thanked for indicating that claims 9 and 20 would be allowable if rewritten in independent form.

The drawings have been amended to correct a minor typographical error.

Claims 1-8, 10-19, and 21-22 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,774,773 to Otsuka et al. (hereinafter "Otsuka") in view of U.S. Patent No. 5,475,469 to Okada et al. (hereinafter "Okada").

Amended claim 1 recites a ring-like cartridge-side shutter which is fitted on the outer surface near the one end of the cylindrical cartridge main body to be movable along the direction of the rotating axis between a position where the developer outlet hole is opened and a position where the developer outlet hole is closed. An advantage of this feature is that the developer outlet hole is opened upon the insertion of the developer cartridge—i.e., rotation of the cartridge is not required.

Otsuka discloses a toner bottle 15 "for allowing toner to flow from the toner bottle when the ring shutter 16 is rotated to a position where the opening 20 is disposed over the opening 19." (Col. 5, lines 15-20.) Otsuka does not teach, suggest, or disclose a ring-like cartridge-side shutter which is fitted on the cartridge and movable along the direction of the rotating axis between open and closed positions of the developer outlet hole. Okada does not cure the deficiencies of Otsuka.

Therefore, claim 1, and all claims dependent thereupon, are believed to be patentable over the cited references. Further, claim 12, and all claims dependent thereupon, are believed to be patentable over the cited references for reasons similar to claim 1.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

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APPENDIX A

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The paragraph beginning at page 16, line 17:

The toner cartridge 300 shown in FIG. 9 is axially supported by a roller [303] 304.  
This roller [303] 304 can be made of an elastic member such as rubber to obtain a high  
acoustic insulation effect.

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APPENDIX B

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1, 9 12 and 20 have been amended as follows:

1. (Amended) A developer cartridge which is inserted in a direction of a rotating axis thereof and rotatably mounted in a developing unit of an image forming apparatus, and supplies a developer to said developing unit while rotating, comprising a cylindrical cartridge main body having a developer outlet hole in an outer surface near one end, and a ring-like cartridge-side shutter which is fitted on the outer surface near said one end of said cylindrical cartridge main body to be movable along [a rotating shaft of said cylindrical cartridge main body] said direction of the rotating axis between a position where the developer outlet hole is opened and a position where the developer outlet hole is closed,

wherein said developing unit has a guide for inserting said developer cartridge and a driving unit for rotating said developer cartridge, said guide has a main body-side shutter with a hole, and when said developer cartridge is [mounted] inserted, said cartridge-side shutter of said cylindrical cartridge main body moves from the position where the developer outlet hole is closed to the position where the developer outlet hole is opened, the developer outlet hole aligns itself with the hole of said main body-side shutter, and every time said cylindrical cartridge main body and said main body-side shutter integrally rotate to align the developer outlet hole and the hole of said main body-side shutter with a developer replenishment port formed below said main body-side shutter, the developer in said developer cartridge is supplied from the developer replenishment port to said developing unit via the developer outlet hole and the hole of said main body-side shutter.

9. (Amended) A developer cartridge [according to claim 1,] which is rotatably mounted in a developing unit of an image forming apparatus, and supplies a developer to said developing unit while rotating, comprising a cylindrical cartridge main body having a developer outlet hole in an outer surface near one end, and a ring-like cartridge-side shutter which is fitted on the outer surface near said one end of said cylindrical cartridge main body to be movable along a rotating shaft of said cylindrical cartridge main body between a

position where the developer outlet hole is opened and a position where the developer outlet hole is closed.

wherein said developing unit has a guide for inserting said developer cartridge and a driving unit for rotating said developer cartridge, said guide has a main body-side shutter with a hole, and when said developer cartridge is mounted, said cartridge-side shutter of said cylindrical cartridge main body moves from the position where the developer outlet hole is closed to the position where the developer outlet hole is opened, the developer outlet hole aligns itself with the hole of said main body-side shutter, and every time said cylindrical cartridge main body and said main body-side shutter integrally rotate to align the developer outlet hole and the hole of said main body-side shutter with a developer replenishment port formed below said main body-side shutter, the developer in said developer cartridge is supplied from the developer replenishment port to said developing unit via the developer outlet hole and the hole of said main body-side shutter,

wherein said cylindrical cartridge main body is supported by a roller which is in contact with the outer surface and made of an elastic material.

12. (Amended) An image forming apparatus comprising a developing unit for developing an electrostatic latent image on an image bearing body with a developer, and a transfer unit for transferring the developed developer image onto a transfer medium,

wherein said developing unit has a developer cartridge which is inserted in a direction of a rotating axis thereof and rotatably mounted to supply the developer to said developing unit while rotating, a guide for inserting said developer cartridge, and a driving unit for rotating said developer cartridge;

said developer cartridge has a cylindrical cartridge main body having a developer inlet hole in an outer surface near one end, and a ring-like cartridge-side shutter which is fitted on the outer surface near said one end of said cylindrical cartridge main body to be movable along [a rotating shaft of said cylindrical cartridge main body] said direction of the rotating axis between a position where the developer outlet hole is opened and a position where the developer outlet hole is closed;

said guide has a main body-side shutter with a hole; and

when said developer cartridge is [mounted] inserted, said cartridge-side shutter of said cylindrical cartridge main body moves from the position where the developer outlet hole is closed to the position where the developer outlet hole is opened, the developer outlet hole aligns itself with the hole of said main body-side shutter, and every time said cylindrical cartridge main body and said main body-side shutter integrally rotate to align the developer outlet hole and the hole of said main body-side shutter with a developer replenishment port formed below said main body-side shutter, the developer in said developer cartridge is supplied from the developer replenishment port to said developing unit via the developer outlet hole and the hole of said main body-side shutter.

20. (Amended) An image forming apparatus [according to claim 12,] comprising a developing unit for developing an electrostatic latent image on an image bearing body with a developer, and a transfer unit for transferring the developed developer image onto a transfer medium,

wherein said developing unit has a developer cartridge rotatably mounted to supply the developer to said developing unit while rotating, a guide for inserting said developer cartridge, and a driving unit for rotating said developer cartridge;

said developer cartridge has a cylindrical cartridge main body having a developer inlet hole in an outer surface near one end, and a ring-like cartridge-side shutter which is fitted on the outer surface near said one end of said cylindrical cartridge main body to be movable along a rotating shaft of said cylindrical cartridge main body between a position where the developer outlet hole is opened and a position where the developer outlet hole is closed;

said guide has a main body-side shutter with a hole;

when said developer cartridge is mounted, said cartridge-side shutter of said cylindrical cartridge main body moves from the position where the developer outlet hole is closed to the position where the developer outlet hole is opened, the developer outlet hole aligns itself with the hole of said main body-side shutter, and every time said cylindrical cartridge main body and said main body-side shutter integrally rotate to align the developer outlet hole and the hole of said main body-side shutter with a developer replenishment port formed below said main body-side shutter, the developer in said developer cartridge is

supplied from the developer replenishment port to said developing unit via the developer outlet hole and the hole of said main body-side shutter.

wherein said cylindrical cartridge main body is supported by a roller which is in contact with the outer surface and made of an elastic material.

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